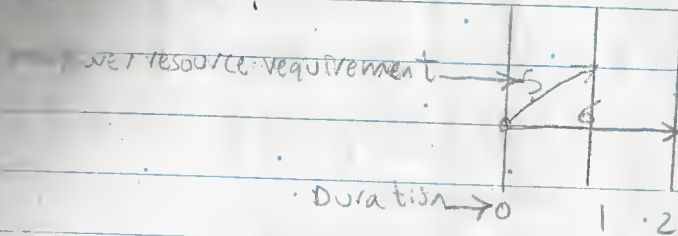


5 Network scheduling with limited resources

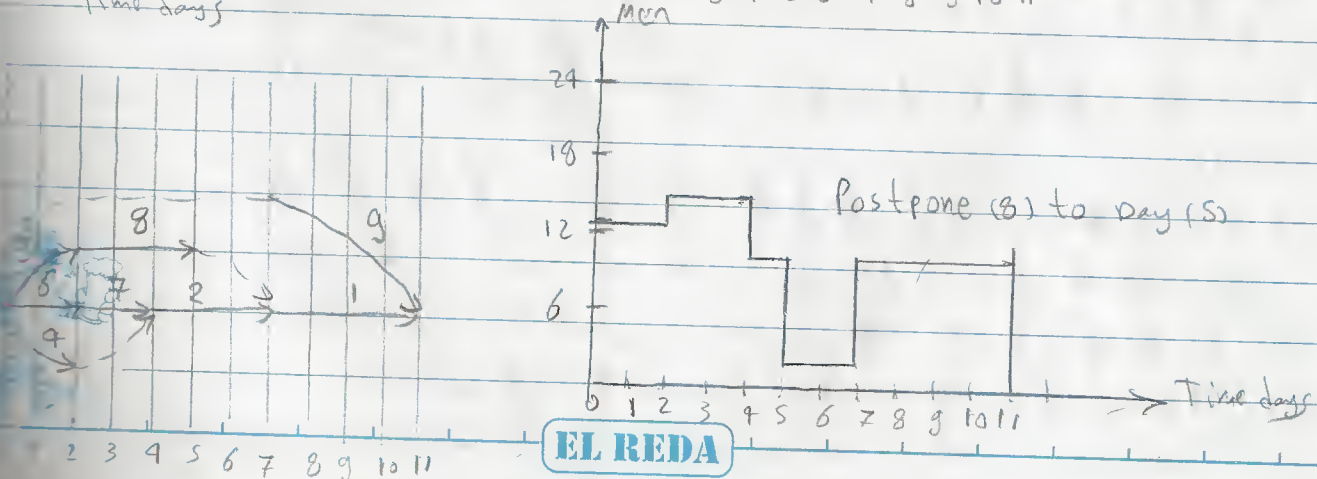
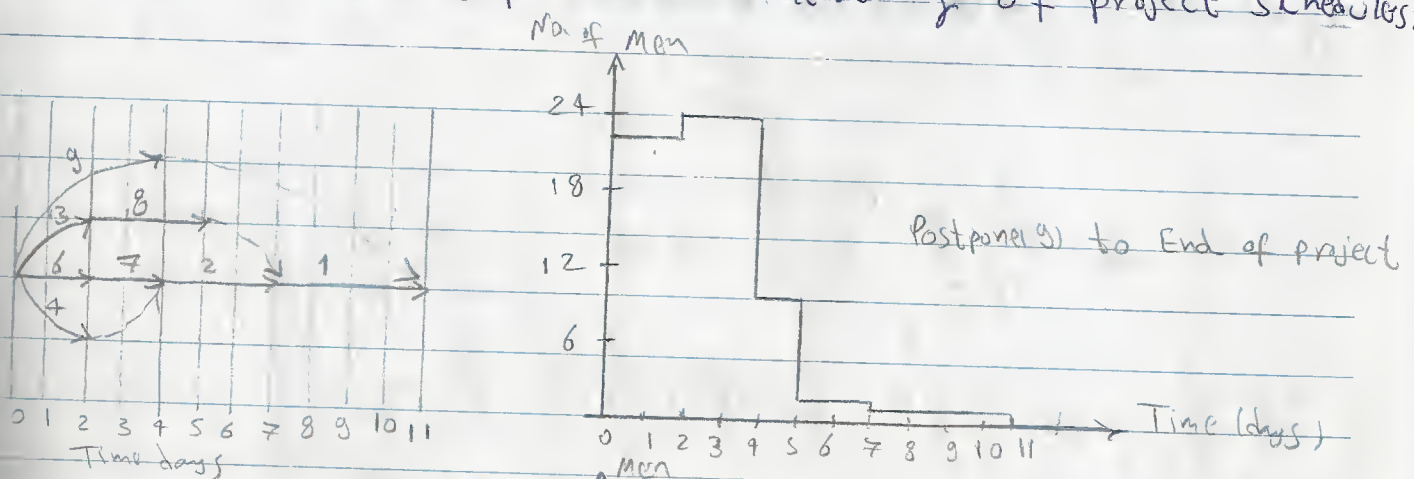
Representation:



* Types of programs:

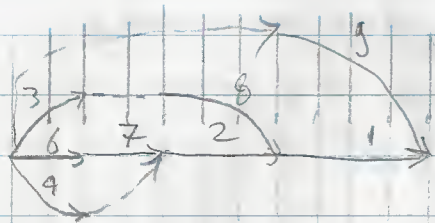
1. Resource leveling programs: Reduce peak resource requirement and smooth out period-to-period assignments with a constraint on project duration
2. Resource allocation programs: Allocate available resources to project activities to decrease time with a constraint on resources limits

* Heuristic methods for resource leveling of project schedules:



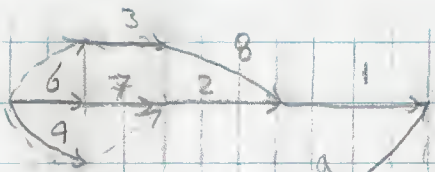
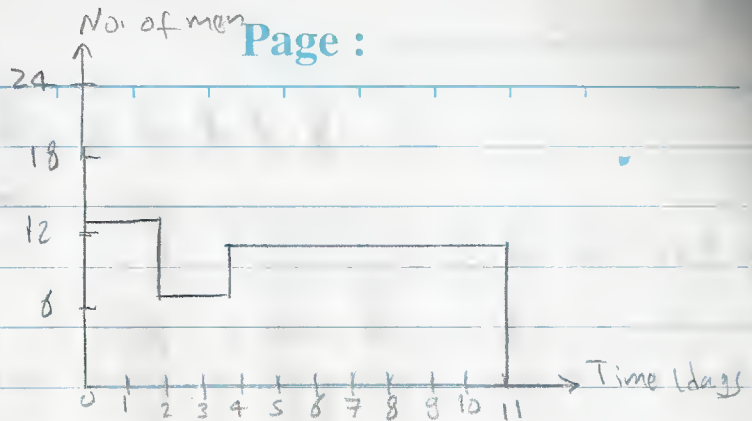
Date :

Page :



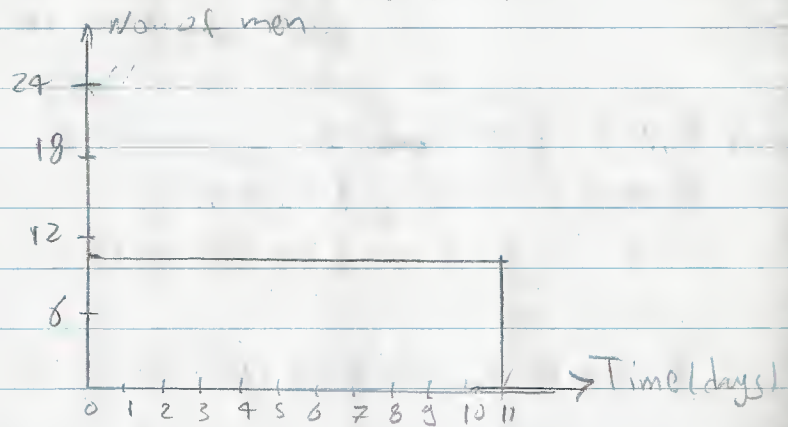
0 1 2 3 4 5 6 7 8 9 10 11

Time (days)



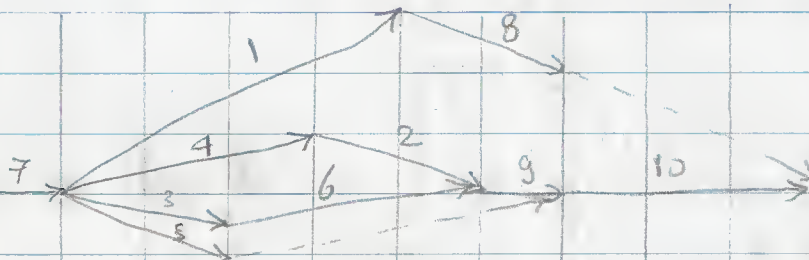
0 1 2 3 4 5 6 7 8 9 10 11

Time (days)



* Heuristic methods for resource allocation in project schedule:

10 men available



Day 1 2 3 4 5 6 7 8 9 10

Manpower 7 13 13 11 9 16 17 10 10 10

Min slack Day-to-day

Day (1):

Schedule job 7 (slack = 0, on critical path); 3 men remain

Day (2):

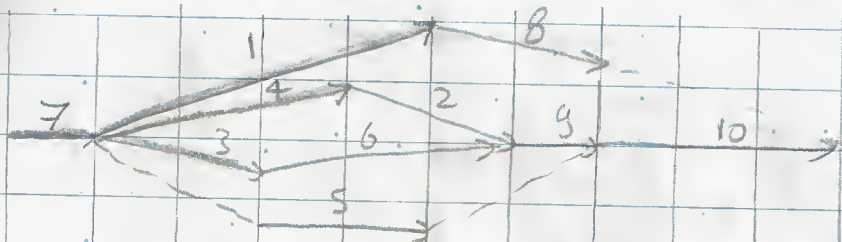
Schedule 3 (slack = 0), 7 men remain

Schedule 4 (slack = 0), 3 men remain

Schedule 1 (slack = 3), 2 men remain

Postpone 5 (slack = 4); 2 men unassigned

- job 3 (slack=0); 7 men remain
 job 4 (slack=0); 3 men remain
 job 1 (slack=3); 2 men remain
 job 5 (slack=4); 2 men unassigned



Day	1	2	3	4	5	6	7	8	9	10
Manpower requirements	7	8	8	16	14	16	17	10	10	10

— Day (4):

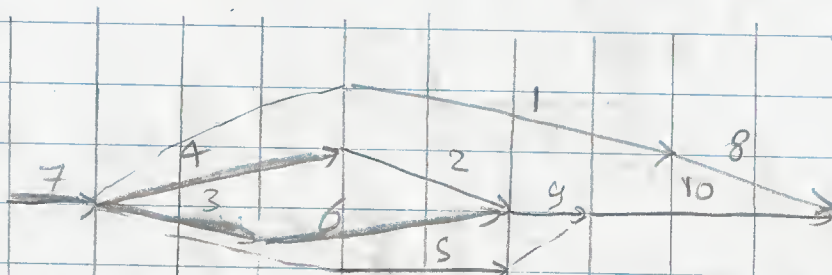
Continue job 4 (slack=0); 6 men remain

Continue job 1 (slack=3); 5 men remain

Job 6 couldn't be postponed (critical job) and non-critical jobs are scheduled first, so reschedule job 1

⇒ Schedule 6 (slack=0); 0 men remain

Postpone job 5 (slack=2)



Day	1	2	3	4	5	6	7	8	9	10
Manpower requirements	7	7	7	10	13	13	10	11	18	18

Day (5):

Continue job 6 (slack=0); 4 men remain

Schedule job 1 (slack=0); 3 men remain

Schedule job 2 (slack=0); 1 man remain

Postpone job 5 (slack=1); 1 man unassigned

Date :

Page :

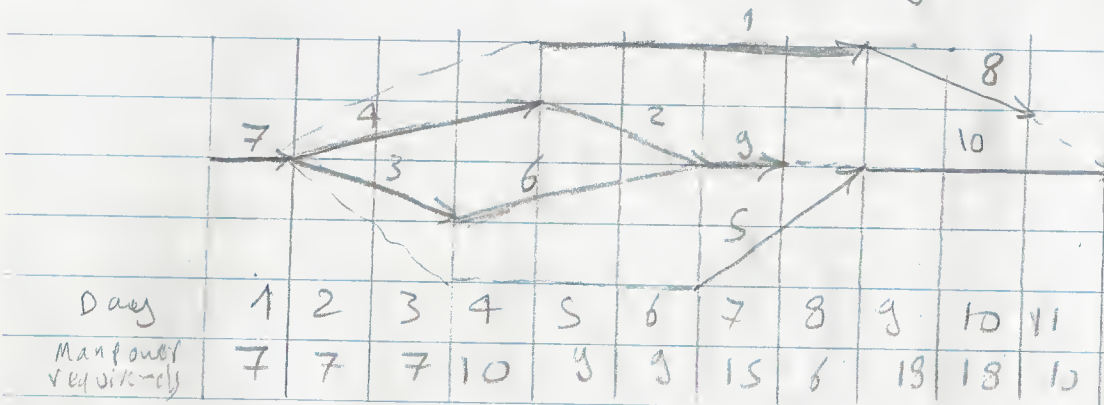
— Day (6);

Continue job 6 (Slack = 0); 4 men remain

Continue job 1 (Slack = 0); 3 men remain

Continue job 2 (Slack = 0); 1 man remaining

⇒ Project should be delayed to postpone job 5 one day



— Day (7);

Continue job 1 (Slack = 1); 3 men remain

Schedule job 5 (Slack = 0); 4 men remain

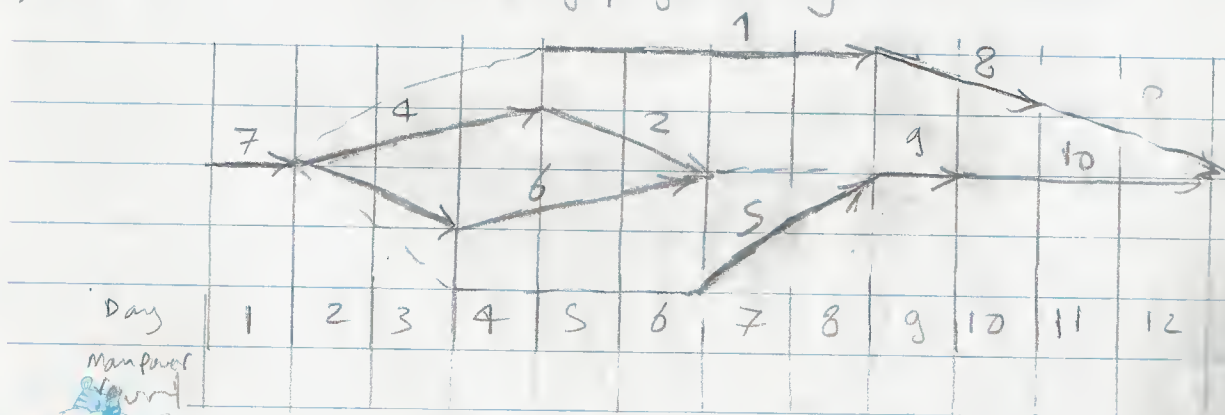
Postpone job 9 (Slack = 1); 1 man unassigned

— Day (8)

Continue job 1 (Slack = 1); 9 men remain

Continue job 5 (Slack = 0); 4 men remain

⇒ Postpone job 9 & delay project 1 day



— Day (9)

Schedule job 9; 1 man remain

Postpone job 8; 1 man unassigned

— Day (10)

Schedule job 10; 0 man remain

Postpone job 8

ET REDA

~~500; 0 man remains~~
~~50 coins; project 1 day~~

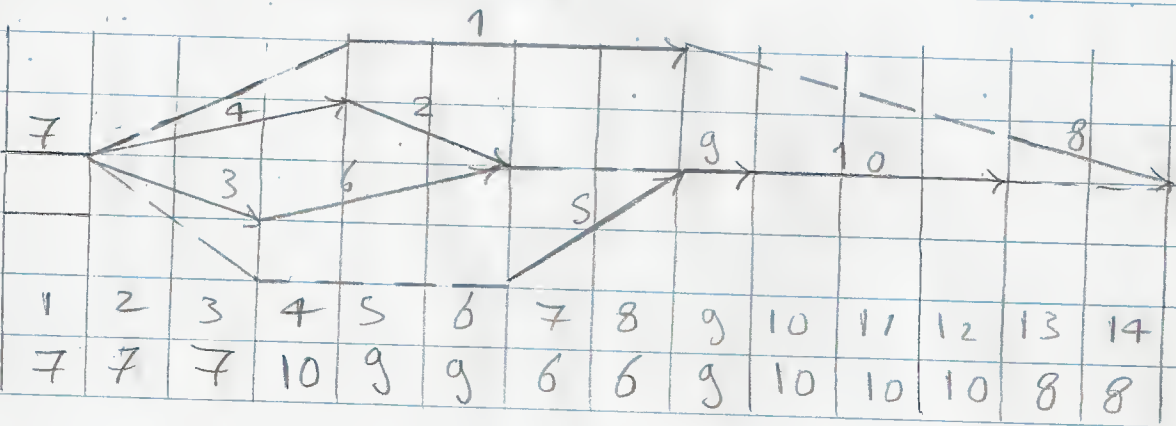
Job 10: onnan remaining

job & delay project iding

Wile jib 8; 2 men vana

14)

time job 2 ; 2 men work



Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Manpower requirement	7	7	7	10	9	9	6	6	9	10	10	10	8	8

